confident that the ability of the investigator will eventually enable him to right himself and find his way out of the woods into the clear light of some important truth as yet unknown to us all.

If, on the other hand, the Editor sometimes rejects a communication in which imagination is more prominent than the facts, or in which the facts have been distorted so as to appear to support a preconceived theory, this may be because meteorology is overburdened with ill-founded notions, and students must be discouraged from pursuing really foolish or unimportant lines of work while the important problems of meteorology are almost neglected on account of their difficulty.

The MONTHLY WEATHER REVIEW is therefore a medium for honest, rational discussion of every important problem of meteorology, whether it be approached from the statistical, the experimental, or the mathematical side. It is not carrying on an unreasonable propaganda.—*C. A.*

DIURNAL VARIATION OF THE BAROMETER.

An article in Gaea, for August, 1905, by Doctor Korselt, of the Realgymnasium, or high school, at Annaberg, Germany, on the causes of the diurnal oscillation of the barometer, attempts to show how this oscillation is an important link in the chain of phenomena that results from the unequal warming of our atmosphere by insolation, and its unequal cooling by radiation. This paper is an elaboration of one presented by Doctor Korselt, in 1893, to the International Meteorological Congress at Chicago.

Korselt develops the idea that the atmosphere may be considered as a heat engine, maintained in operation by the periodical accession of solar heat, in which the motion of the atmosphere is the work that is done. The location of the driving force, analogous to a steam boiler, is in the Tropics. The pushing of the hot air from the Torrid Zone toward either pole, and its return as cold air, is renewed daily by the rotation of the earth, and is analogous to the expansion and contraction of the steam cylinder. His memoir of 1905 develops this conclusion in a popular way, without the ordinary formulas of mechanics; and he also concludes that the minute study of the daily barometric oscillation can be of great value for practical forecasting, because it ought to give us information about conditions in the atmosphere at altitudes which balloons have not yet been able to attain. If, for instance, we compiled a daily weather chart, showing the observed difference between the barometric ranges by day and by night (that is to say, the day range between the 10 a. m. maximum and the 4 p. m. minimum, and also the night range between the 10 p. m. maximum and the 4 a. m. minimum), we shall, he thinks, probably find that any temporary area of low pressure has a tendency to move toward the region where this difference of the ranges is a minimum.

The application of Korselt's rule can probably be tested in the United States better than in any other part of the world, since every regular station has its self-recording barometer, and could easily telegraph every morning the extent of the day range and night range during the preceding twenty-four hours. On the other hand these ranges are so small, and often so completely covered up by the nonperiodic changes, that relatively very large and misleading errors would seem to be inevitable.—*C. A.*

INFLUENCE OF THE OCEAN ON CONTINENTAL PRECIPITATION.

In a recent paper before the Société Helvétique des Sciences Naturelles on the interchange of moisture between land and sea,[1] Prof. Dr. Ed. Brückner estimates that 93 per cent of all the water evaporated from the ocean is returned to it in the form of precipitation, leaving but 7 per cent available for distribution over the land surface. Of the total precipitation over the land, 20 per cent is supplied directly by the ocean, while the remaining four-fifths is the recondensation of vapor evaporated from the continents.

Professor Brückner's figures appear to be based upon the following approximate data:

1. Total evaporation from the sea, 384,000 cubic kilometers.
2. Total precipitation upon the land surface, 122,000 cubic kilometers.
3. Total volume of water returned to the sea by rivers, 24,000 cubic kilometers.

It is evident that in the long run as much water must be returned to the ocean as is taken from it. We may consider that this water is returned to the ocean in three ways: (*a*) by precipitation of water evaporated from the ocean surface; (*b*) by precipitation of water evaporated from the land and carried by winds over the ocean; (*c*) by rivers.

The rivers, therefore, are the means by which the land returns to the ocean all of the oceanic waters carried over the land and not returned in the form of aqueous vapor (as given under *b* above), and the total volume of the rivers therefore represents the difference between the amount of vapor passing from the sea over the land and that passing from the land over the sea.

By subtracting the third quantity from the first, we obtain the total precipitation over the ocean, while the difference between the second quantity and the third gives the land precipitation due to evaporation from the land.

If we might depend upon the accuracy of these figures and the underlying assumptions, it would appear that were the influence of the oceans eliminated the continents would still receive four-fifths of their present precipitation. But it is obvious that the three quantities above given are derived from measurements both incomplete and inexact. The accurate determination of evaporation is a problem that much investigation has never solved. Of the total discharge of the Amazon, the largest of rivers, and of the rainfall in its sparsely inhabited basin we have but a vague idea. The large rivers of China have never been systematically measured, and the same is true of the precipitation over extensive provinces of this secluded country. Africa has many regions as yet guiltless of the rain gage and rivers unstudied by the hydrographic engineer. In all countries numerous smaller streams, individually too unimportant to demand investigation, augment by a considerable total annual volume the waters of the sea. With the spread of civilization and the increased application of scientific methods to practical ends, we may hope to approximate closer and closer to the true values of such large factors as Professor Brückner considers. In the meantime, his figures may be provisionally accepted as indicating that the direct influence of the ocean upon continental precipitation is less than has been generally supposed.—*F. O. S.*

[1] Sur le bilan du cycle de l'eau sur la terre. Archives des sci. phys. et nat. Genève, Oct., 1905. Tome 20, p. 427-30.

PRESSURE AND RAINFALL OVER THE INDIAN MONSOON AREA.

Dr. W. L. Dallas, first assistant of the Indian Meteorological Office, has presented to the American Philosophical Society a memoir on the above subject, of which an abstract is published in the proceedings of that society, Vol. XLIV, pages 159-163, from which we quote the following:

> The investigation has brought out certain relationships which appear at least worthy of record. The tentative conclusions arrived at are as follows:
>
> (1) That over the trades-monsoon area, and most markedly so over the equatorial belt, there occur four-year oscillations of pressure; (2) that during the rising portions of these oscillations the *general* rainfall of the trades-monsoon area is below, and during the falling portions is above the average, with a well-marked minimum of rainfall in the first year of the cycle and a well-marked maximum of rainfall in the third year; (3)